इंटरनेट मानक

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IS 10591 (1983): Segmental Saws for Cold Sawing [PGD 32: Cutting tools]

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UDC 674·053 : 621·934·2

IS : 10591 - 1983

Indian Standard

SPECIFICATION FOR SEGMENTAL SAWS FOR COLD SAWING

Small Tools Sectional Committee, EDC 45; *and* Saw Blades Subcommittee, EDC 45 : 6 [Ref : Doc : EDC : 45 (3346)]

1. Scope — Covers the dimensions and requirements for segmental saws comprising saw segments, saw body and rivets for assembling the saw segments on saw body.

2. Terminology

2.1 *Segmental Saws* — A circular saw with a body of carbon steel or spring steel and a riveted rim of toothed high speed steel segments forming the cutting edges.

2.1.1 *Saw Segments* — A replaceable segment of toothed high speed steel rim forming the cutting edges.

2.1.2 *Saw Body* — A circular body of carbon steel or spring steel with a bore and driving pin holes and a periphery to receive saw segments.

2.1.3 *Rivet* — Made of mild steel with countersunk head for assembly of the saw segments to saw body.

3. Dimensions

3.1 *Segmental Saws* — Shall be as given in Table 1.

3.2 *Saw Segments* — Shall be as given in Table 2.

3.3 *Saw Body* — Shall be as given in Table 3.

3.4 *Rivets* — Shall be as given in Table 4.

4. Material

4.1 *Saw Segments* — High speed steel.

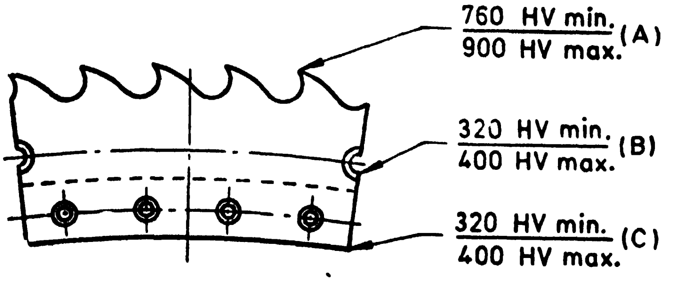
Note — Unless otherwise specified, the high speed steel shall be according to T83W6Mo5Cr4V2 or T72W18Cr4V1 or equivalent, in which case the major constituents shall be specified by the manufacturer.

4.2 *Saw Body* — Spring steel or high carbon steel.

4.3 *Rivet* — Mild steel as per IS : 1148 - 1973 'Specification for hot rolled steel rivet bars (up to 40 mm diameter) for structural purposes (*second revision*)' and IS : 7557-1974 'Specification for steel wire (up to 20 mm) for the manufacture of cold forged rivets' or equivalent.

5. Hardness

5.1 *Saw Segments* — Saw segments shall be heat treated in such a manner that they fulfil the requirement of hardness as given in figure below:


760 HV min. / 900 HV max. (A)
320 HV min. / 400 HV max. (B)
320 HV min. / 400 HV max. (C)

(*A*) At the cutting portion
(*B*) At the slot upper end
(*C*) Below the lower rivet hole

5.2 *Saw Body* — 380 *HV* to 440 *HV*.

5.3 *Rivet* — To be kept soft.

Adopted 27 May 1983

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Gr 4

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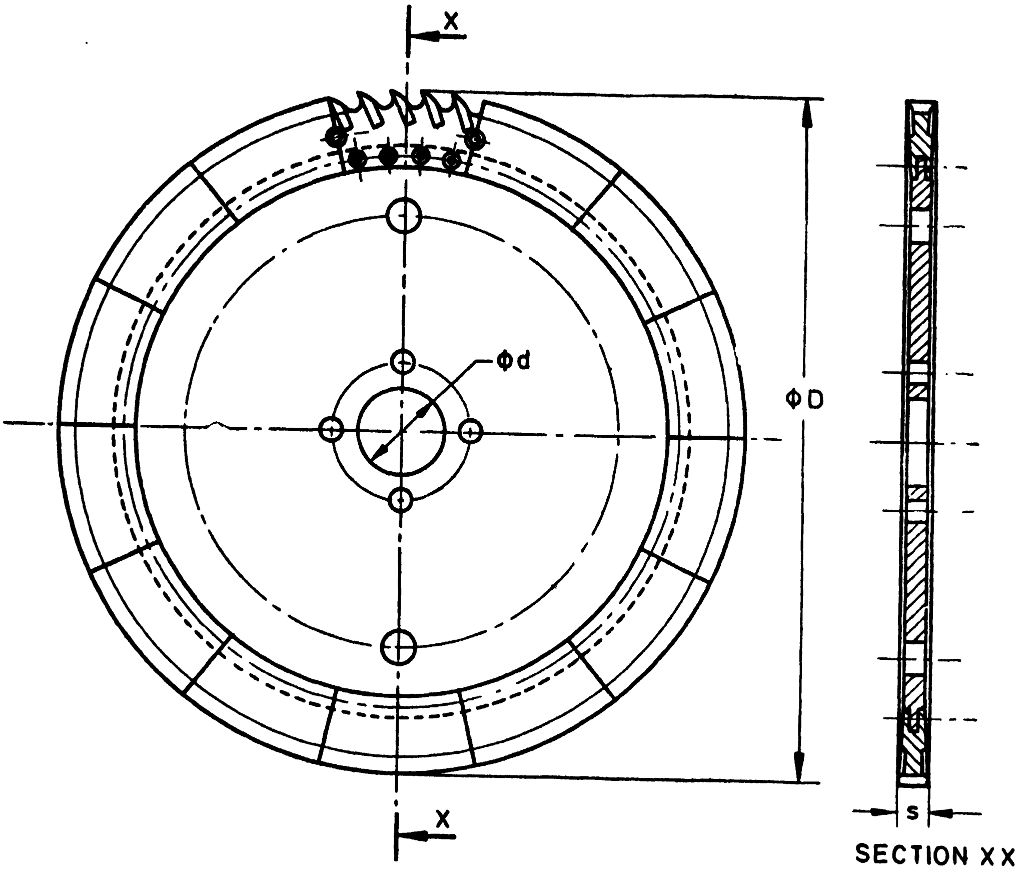
TABLE 1 DIMENSIONS OF SEGMENTAL SAWS

(*Clause* 3.1)

All dimensions in millimetres.



Z — No. of teeth per saw
P — Pitch of the teeth in mm

Nominal Size *D* js15	*d* h7	Top Thickness *s* js11	Number of Segments		Number of Teeth per Segment							
					2	3	4	5	6	8	10	12
250	32	3·0	12	*Z*	—	36	48	60	72	96	—	—
				P	—	21·8	16·4	13·1	10·9	8·2	—	—
275	32	3·0	10	*Z*	—	30	40	50	60	80	—	—
				P	—	28·6	21·6	17·3	14·4	10·8	—	—
315	40	4·0	14	*Z*	—	42	56	70	84	112	—	—
				P	—	23·6	17·7	14·1	11·5	8·8	—	—
(360)	50	4·5	16	*Z*	—	48	64	80	96	128	—	—
				P	—	23·6	17·7	14·1	11·8	8·8	—	—
400	50	4·5	18	*Z*	—	54	72	90	108	144	—	—
				P	—	23·3	17·5	14	11·6	8·7	—	—
(420)	50	5·0	18	*Z*	—	54	72	90	108	144	—	—
				P	—	24·4	18·3	14·7	12·2	9·2	—	—
(470)	50	5·5	18	*Z*	—	54	72	90	108	144	—	—
				P	—	27·3	20·5	16·4	13·7	10·3	—	—
500	50	5·5	18	*Z*	—	54	72	90	108	144	—	—
				P	—	29·1	21·8	17·5	14·5	10·9	—	—
(520)	50	6·0	18	*Z*	—	54	72	90	108	144	—	—
				P	—	30·3	22·7	18·2	15·1	11·2	—	—

(*Continued*)

TABLE 1 DIMENSIONS OF SEGMENTAL SAWS — *Contd*

Nominal Size *D* js15	*d* h7	Top Thickness *s* js11	Number of Segments		Number of Teeth per Segment							
					2	3	4	5	6	8	10	12
(560)	50	6·0	18	*Z*	—	54	60	90	108	144	—	—
				P	—	32·6	24·4	19·6	16·3	12·0	—	—
(610)	80	6·0	20	*Z*	—	60	80	100	120	160	200	—
				P	—	31·9	24·0	19·2	16·0	12·0	9·6	—
630	80	6·0	20	*Z*	—	60	80	100	120	160	200	—
				P	—	33·0	24·7	19·8	16·5	12·4	9·9	—
(660)	80	6·0	20	*Z*	—	60	80	100	120	160	200	—
				P	—	34·6	25·9	20·7	17·3	13·0	10·4	—
(710)	80	6·5	24	*Z*	—	72	96	120	144	192	240	288
				P	—	31·0	23·2	18·6	15·5	11·6	9·8	7·7
(760)	80	6·5	24	*Z*	—	72	96	120	144	192	240	288
				P	—	33·2	24·9	19·9	16·6	12·4	9·9	8·3
800	80	7·0	24	*Z*	—	72	96	120	144	192	240	288
				P	—	34·9	26·2	20·9	17·5	13·1	10·5	8·7
810	80	7·0	30	*Z*	—	72	96	120	144	192	240	288
				P	—	35·5	28	22·4	18	14	11·2	9
(870)	80	7·5	30	*Z*	—	90	120	150	180	240	300	360
				P	—	30·4	22·8	18·2	15·2	11·4	9·1	7·6
(920)	100	8·0	30	*Z*	60	90	120	150	180	240	300	360
				P	48·2	32·1	24·1	19·3	16·1	12·0	9·6	8·0
1 000	100	8·0	30	*Z*	60	90	120	150	180	240	300	360
				P	52·4	35·0	26·2	21·0	17·5	13·1	10·5	8·7
(1 010)	100	8·0	30	*Z*	60	90	120	150	180	240	—	—
				P	52·8	35·3	26·4	21·2	17·6	13·2	—	—
(1 120)	100	8·0	36	*Z*	72	108	144	180	216	288	—	—
				P	48·8	32·6	24·4	19·5	16·3	12·2	—	—
(1 210)	100	8·0	36	*Z*	72	108	144	180	216	288	—	—
				P	52·8	35·2	26·4	21·1	17·6	13·2	—	—
1 250	100	9·0	36	*Z*	72	108	144	180	216	288	—	—
				P	54·6	36·4	27·3	21·8	18·2	13·1	—	—
(1 430)	120	10·5	36	*Z*	72	108	144	180	216	288	—	—
				P	62·4	41·6	31·2	25·0	20·8	15·6	—	—
1 600	120	12·5	40	*Z*	80	120	160	200	240	—	—	—
				P	62·8	41·9	31·4	25·1	21·0	—	—	—
2 000	120	14·5	44	*Z*	88	132	176	220	264	—	—	—
				P	71·4	47·6	35·7	28·6	23·8	—	—	—

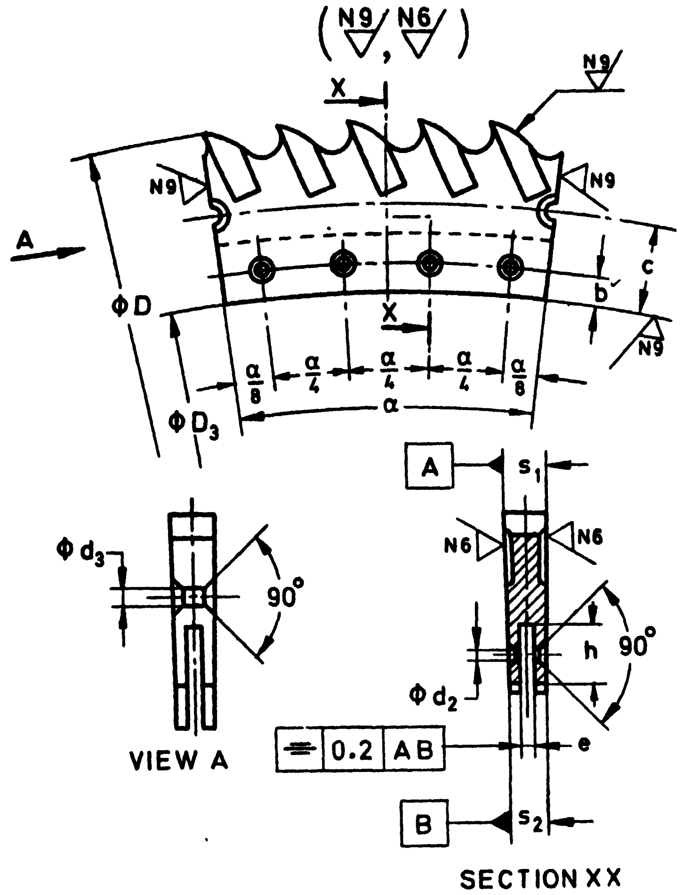
Note 1 — Non-preferred sizes are given within parenthesis.

Note 2 — Efforts shall be made by the users and the manufacturers for changing over to the preferred sizes in due course of time.

TABLE 2 DIMENSIONS OF SAW SEGMENTS

(*Clause* 3.2)

All dimensions in millimetres.



Nominal Size D js15	Top Thick-ness s_1 js11	Number of Teeth per Segment	b h11	c js13	D_3 js10	Slot Width e H11	h H14	Rivet Lower d_2 +0 −0·1	Holes Upper d_3 +0 −0·2	α	s_2 js13
250	3·0	— 3 4 5 6 8 — —	4·35	13·0	192·0	1·2	9·0	3·5	4·5	30°	2·5
275	4·0	— 3 4 5 6 8 — —	4·60	13·0	214·0	1·2	9·0	3·5	4·5	36°	3·0
315	4·0	— 3 4 5 6 8 — —	5·0	13·0	248·0	1·2	9·5	3·5	5·0	25° 42′ 52″	3·0
(360)	4·5	— 3 4 5 6 8 — —	6·0	16·0	296·0	1·5	12·0	4·0	4·0	22° 30′	3·4
400	4·5	— 3 4 5 6 8 — —	6·0	16·0	316·0	1·5	12·0	4·0	4·0	20°	3·4
(420)	5·0	— 3 4 5 6 8 — —	6·3	15·8	336·0	1·5	12·5	4·5	4·5	20°	3·5
(470)	5·5	— 3 4 5 6 8 — —	6·5	16·0	387·0	1·5	12·5	4·5	4·5	20°	4·0
500	5·5	— 3 4 5 6 8 — —	7·0	21·0	410·0	1·65	17·0	4·5	4·5	20°	4·25
(520)	6·0	— 3 4 5 6 8 — —	7·5	21·0	430·0	1·65	17·0	5·0	5·0	20°	4·25
(560)	6·0	— 3 4 5 6 8 — —	7·5	18·5	470·0	2·0	15·0	4·5	4·5	20°	4·10
(610)	6·0	— 3 4 5 6 8 10 —	7·5	21·0	520·0	1·8	15·0	5·0	5·0	18°	4·4
630	6·0	— 3 4 5 6 8 10 —	5·75	14·75	540·0	2·0	11·0	4·5	5·5	18°	4·2
(660)	6·0	— 3 4 5 6 8 10 —	7·0	20·5	570·0	2·0	14·0	5·0	5·0	18°	4·5
(710)	6·5	— 3 4 5 6 8 10 12	7·5	20·2	620·0	2·0	15·45	5·0	5·0	15°	5·0
(760)	6·5	— 3 4 5 6 8 10 12	7·5	21·0	670·0	2·0	15·0	5·0	5·0	15°	5·0
800	7·0	— 3 4 5 6 8 10 12	6·0	17·5	700·0	2·2	13·0	5·0	5·5	15°	5·0
810	7·0	— 3 4 5 6 8 10 12	9·0	24·0	715·0	2·5	18·0	6·1	6·1	15°	5·4
(870)	7·5	— 3 4 5 6 8 10 12	8·0	22·0	760·0	2·0	17·0	5·5	5 5	12°	5·5
(920)	8·0	2 3 4 5 6 8 10 12	9·5	24·0	814·0	2·4	19·0	6·0	6·0	12°	5·7
1 000	8·0	2 3 4 5 6 8 — —	7·0	17·3	900·0	2·5	13·5	6·0	6·0	12°	6·0
(1 010)	8·0	2 3 4 5 6 8 — —	7·0	17·3	910·0	2·5	13·5	5·5	6·5	12°	6·0
(1 120)	8·0	2 3 4 5 6 8 — —	9·5	23·0	1 017·0	2·7	19·0	6·0	6·0	10°	6·1
(1 210)	8·0	2 3 4 5 6 8 — —	8·0	22·5	1 098·0	2·5	15·5	6·0	6·0	10°	6·1
(1 250)	9·0	2 3 4 5 6 8 — —	7·5	21·0	1 136·0	3·0	14·7	6·0	6·0	10°	7·4
(1 430)	10·5	2 3 4 5 6 8 — —	10·0	26·5	1 300·0	3·6	21·0	7·0	7·0	10°	8·0
1 600	12·5	2 3 4 5 6 — — —	10·0	26·5	1 470·0	4·0	21·0	7·0	7·0	9°	8·6
2 000	14·5	2 3 4 5 6 — — —	10·0	26·5	1 870·0	6·0	21·0	7·0	7·0	8° 10′ 55″	12·0

Note 1 — Non-preferred sizes are given within parenthesis.

Note 2 — Efforts shall be made by the users and the manufacturers for changing over to the preferred sizes in due course of time.

AMENDMENT NO. 1 JULY 1987

TO

IS:10591-1983 SPECIFICATION FOR SEGMENTAL SAWS FOR COLD SAWING

(*Page* 4, *Table* 2, *col Slot Width* e H11) - Substitute '1.5' *for* '1.65' against Nominal Size D js15 = 500 mm.

(*Page* 5, *Table* 3, *col Rivet Holes, PCD* D_2 j10) - Substitute '424' *for* '430' against Nominal Size D js15 = 500 mm.

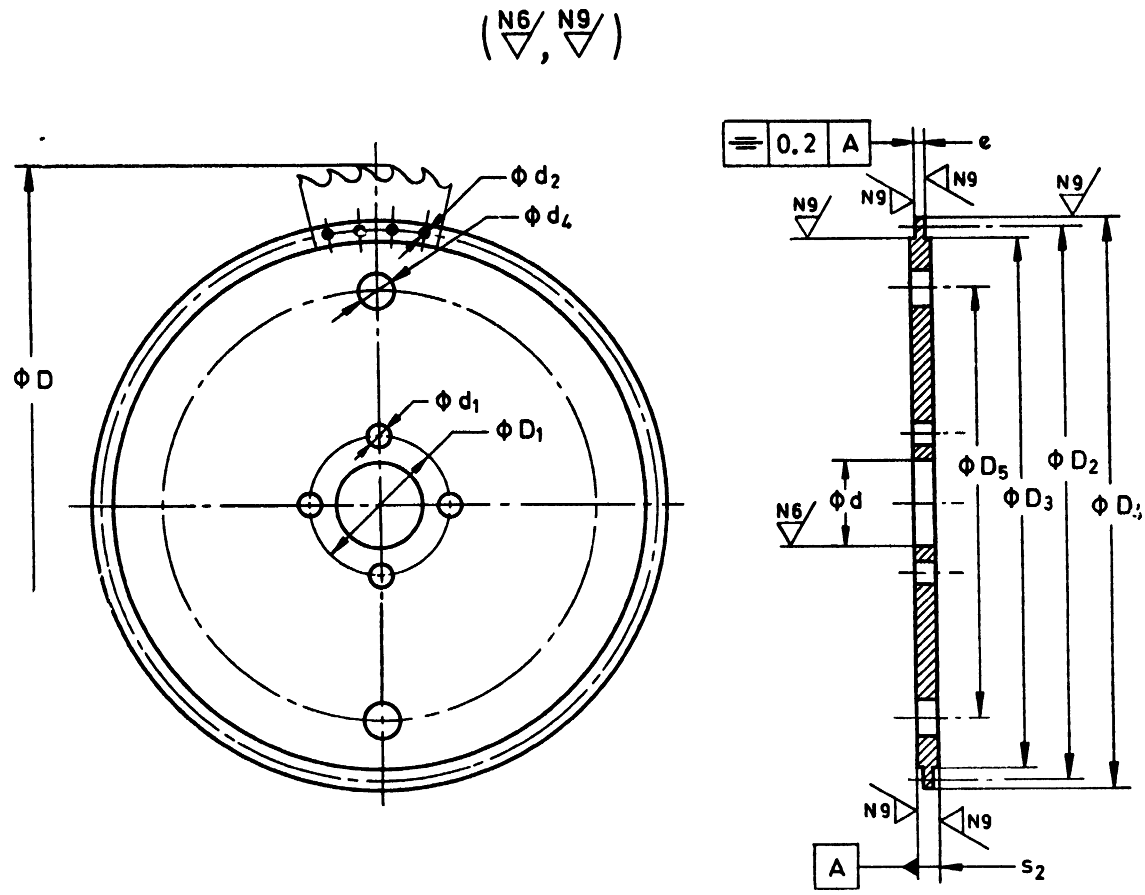
(EDC 45)

Reprography Unit, BIS, New Delhi, India

TABLE 3 DIMENSIONS OF SAW BODY

(*Clause* 3.3)

All dimensions in millimetres.



Nominal Size *D* js15	*d* H7	Driving Pin Holes			Rivet Holes		*D*₃ h9	*D*₄ d12	*s*₂ h12	*e* h11	*d*₄	*D*₅
		*d*₁ js14	PCD *D*₁ j11	No. of Pin Holes	PCD *D*₂ j10	*d*₃ +0·1						
250	32	8·5	50	4	200·7	3·5	192	209	2·5	1·2	—	—
275	32	10	50		223	3·5	214	230	2·6	1·2	—	—
315	40	10·5	63		258	3·5	248	265	2·8	1·3	—	—
(360)	50	17	80		308	4·0	296	320	3·1	1·5	—	—
400	50	17	80		330	4·0	316	340	3·4	1·5	—	—
(420)	50	17	80		348·6	4·5	336	360	3·4	1·5	—	—
(470)	50	17	80		400	4·5	387	410	3·4	1·5	—	—
500	50	17	100		430	4·5	410	440	3·4	1·5	—	—
(520)	50	17	100		445	5·0	430	462	4·0	1·65	—	—
(560)	50	17	100		485	4·5	470	500	3·7	2·0	—	—
(610)	80	22	120		535	5·0	520	549	4·0	1·8	—	—
630	80	22	120		551·5	4·5	540	561	4·0	2·0	—	—
(660)	80	22	120		584	5·0	570	598	4·0	2·0	—	—
(710)	80	22	120		635	5·0	620	650	4·7	2·0	—	—
(760)	80	22	120		685	5·0	670	700	4·7	2·0	—	—
800	80	22	120		712	5·0	700	725	5·0	2·2	18	500
(810)	80	27	160		733	6·1	715	751	4·9	2·5	18	502
(870)	80	22	120		776	5·5	760	792	5·0	2·0	18	500
(920)	100	32	200		833	6·0	814	851	5·5	2·4	18	500
1 000	100	32	200		914	6·0	900	926	6·0	2·5	18	500
(1 010)	100	32	200		924	6·0	910	936	6·0	2·5	18	500
(1 120)	100	32	200		1 036	6·0	1 017	1 054	6·0	2·7	22	500
(1 210)	100	32	200		1 114	6·0	1 098	1 128	7·0	2·5	22	1 000
1 250	100	32	200		1 151	6·0	1 136	1 163	7·0	3·0	22	1 000
(1 430)	120	40	315		1 320	7·0	1 300	1 340	8·0	3·6	22	1 000
1 600	120	40	315		1 511	7·0	1 490	1 530	8·6	4·0	22	1 200
2 000	120	40	400		1 890	7·0	1 870	1 910	12·0	6·0	22	1 400

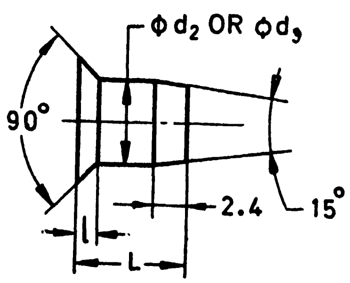
Note 1 — Non-preferred sizes are given within parenthesis.

Note 2 — Efforts shall be made by the users and the manufacturers for changing over to the preferred sizes in due course of time.

TABLE 4 DIMENSIONS OF SEGMENTAL SAW RIVET

(*Clause* 3.4)

All dimensions in millimetres.



Nominal Size of Segmental Saw	d_2 0 −0·05	d_3 0 −0·05	L +0·4 0	l +0 −0·2
250	3·3	4·2	4·5	1·6
275	3.3	4·2	4·5	1·6
315	3·3	4·7	5·5	1·6
(360)	3·7	3·7	6·5	1·6
400	3·7	3·7	6·5	1·6
(420)	4·2	4·2	6·5	1·6
(470)	4·2	4·2	6·5	1·6
500	4·2	4·2	6·5	1·6
(520)	4·7	4·7	8·0	1·6
(560)	4·2	4·2	7·7	1·6
(610)	4·7	4·7	8·0	1·6
630	4·2	5·2	8·0	1·6
(660)	4·7	4·7	8·0	1·6
710	4·7	4·7	8·0	1·6
(760)	4·7	4·7	8·0	1·6
800	5·6	5·6	9·0	1·6
810	4·7	5·2	9·5	1·6
(870)	5·2	5·2	9·5	1·6
(920)	5·6	5·6	9·0	1·6
1 000	5·6	5·6	9·0	1·6
(1 010)	5·2	6·0	10·0	1·6
(1 120)	5·6	5·6	10·0	1·6
(1 210)	5·6	5·6	10·0	1·6
1 250	5·6	5·6	13·0	1·6
(1 430)	6·5	6·5	14·0	2·5
1 600	6·5	6·5	16·5	2·5
2 000	6·5	6·5	19·0	2·5

Note 1 — Non-preferred sizes are given within parenthesis.

Note 2 — Efforts shall be made by the users and the manufacturers for changing over to the preferred sizes in due course of time.

Note 3 — Diameters d_2 and d_3 are the same as given in Tables 2 and 3.

6. Designation

6.1 *Saw Segment* — A saw segment for saw diameter 500 mm having 5 teeth per segment of tool type 'N' and conforming to this standard shall be designated as:

Saw Segment 500×5 IS : 10591

6.1.1 If the saw segment is required with tool type other than 'N', the 'tool type' 'H' or 'S' as appropriate shall be added in the designation immediately after the size.

6.2 *Saw Body* — A saw body having a saw diameter 500 mm, bore 50 mm and conforming to this standard shall be designated as:

Saw Body 500×50 IS : 10591

6.3 *Rivet* — A rivet of diameter 4·2 mm and length 6·5 mm to be used with saw of diameter 500 mm and conforming to this standard shall be designated as:

Segmental Saw Rivet 4·2×6·5 IS : 10591

6.4 *Assembled Segmental Saw* — A segmental saw having diameter 500 mm, 18 segments having 5 teeth per segment of tool type 'N' and conforming to this standard shall be designated as:

Segmental Saw 500×18/5 IS : 10591

6.4.1 If the segmental saw is required with tool type other than 'N', the 'tool type' 'H' or 'S', as appropriate shall be added in the designation immediately after the size.

7. Form Tolerance on Assembled Saw

7.1 *Radial Runout*

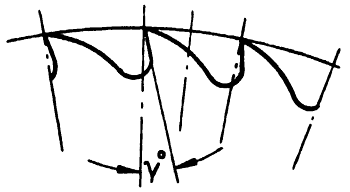
For saw dia up to 500 mm	0·15 mm *Max*
Over 500 up to 1 010 mm	0·30 mm *Max*
Over 1 010 up to 2 000 mm	0·50 mm *Max*

7.2 *Axial Runout*

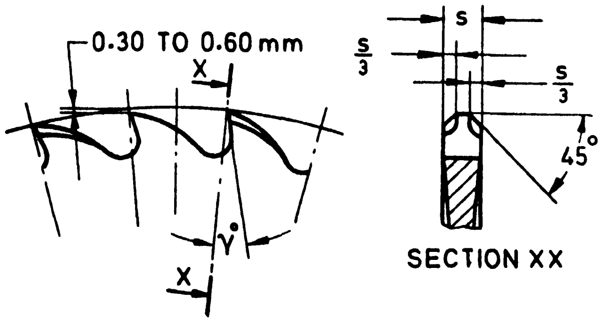
For saw dia up to 500 mm	0·20 mm *Max*
Over 500 mm up to 1 010 mm	0·30 mm *Max*
Over 1 010 mm up to 2 000 mm	0·50 mm *Max*

8. Tooth Shape

8.1 *Tooth Shape of Saw Segment* — Shall be as given in figure below:



8.2 *Tooth Shape of Assembled and Ground Saw* — Shall be as given in figure below:



8.3 *Rake Angle*

Rake Angle J		For Tool Type
N	H	S
15°	8°	25°

Tool type 'N', 'H' or 'S' as given in 'IS : 1830-1982 'Technical supply conditions for milling cutters (*second revision*)'.

9. General Requirements

9.1 *Side Clearance* — Side clearance on segments shall be approximately one degree per side.

9.2 Grinding allowance on side matching faces of saw segment shall be 0·1 mm to 0·3 mm per side.

9.3 Unless otherwise specified the saws shall be supplied according to type 'N'.

9.4 The slots of the saw segment and the fin of the saw body shall be free from burrs to facilitate easy assembly.

10. Workmanship and Finish — The assembled saws shall be supplied heat treated, ground and ready for use. They shall be well finished and free from burrs, cracks and other surface defects.

11. Marking

11.1 Saw segment shall be marked with nominal saw diameter, numbers of segments per saw, number of teeth per segment, material (HSS) and manufacturer's name or trade-mark.

11.2 Assembled saw shall be marked with nominal saw diameter, the number of segments per saw, number of teeth per segment, material (HSS) and manufacturer's name or trade-mark.

11.3 Each saw body shall be marked with nominal saw diameter, bore and manufacturer's name or trade-mark.

11.4 *ISI Certification Marking* — Details available with Indian Standards Institution.

EXPLANATORY NOTE

In the preparation of this standard considerable assistance has been derived from ISO 2924-1973 'Solid and segmental circular saws for cold cutting of metals — Interchangeability dimensions of the drive — Saw diameter range 224 to 2 240' issued by the International Organization for Standardization.

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